City of White Rock
2020 Annual Water Report

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Introduction

The City of White Rock (CoWR) is a unique, ocean-side community of nearly 20,000 citizens known for its sunny weather, expansive beach, historic pier, delightful restaurants, and sense of community. The City is located half an hour south of Vancouver on the shore of Semiahmoo Bay.

The City of White Rock's Water Division provides safe and clean drinking water to its residents. The Engineering and Municipal Operations Department is responsible for the maintenance, repair and upgrades of the water supply and distribution system.

The Conditions of Permit issued by Fraser health was issued on August 21, 2019 (Appendix A):

1. The drinking water must be treated to provide an acceptable secondary disinfectant to the whole system that meets requirements of the Guidelines for Canadian Drinking Water Quality and is acceptable to Fraser Health Authority.
2. Arsenic and Manganese levels of the treated water must be monitored on a quarterly basis as a minimum. The results are to be provided to Fraser Health.
3. The City of White Rock has a Level IV certified water treatment operator. The operator has been certified by Environmental Operators Certification Program (EOCP).

Overview: Water Quality Milestones

2020 was the City of White Rock's fifth year of operating the water utility. Since acquiring the water utility at the end of October 2015, the City has accomplished some substantial milestones, all of which reflect our commitment to delivering safe and clean drinking water to our residents.

- May 31, 2019 - Water Treatment Plant achieved Notice of Completion
- October 26, 2020 - The water utility was moved to be under the Operations Department to better utilize resources.

While our water quality meets Canadian Drinking Water Guidelines, we are always striving to improve water quality beyond what is mandated, enhance the reliability and resiliency of our water infrastructure, and plan for our future.

Stay up to date with water related initiatives in White Rock at www.whiterockcity.ca/230/Water.

Source Water

Drinking water is obtained from the Sunnyside Uplands Aquifer, and distributed through seven wells located throughout the City, Figure-1.

The Sunnyside Aquifer is an important natural resource that is used as the water supply source for the CoWR. Population growth, climate change, sea level rise, and other users of the aquifer may put increasing pressure on the water supply system. The CoWR developed an Aquifer Protection Plan in 2018 as a key component in protecting the community's water supply source. Groundwater protection goals include stakeholder engagement, advancing the understanding of aquifer characteristics, protecting groundwater quality from contamination, and ensuring future withdrawals sustainably meet future demands.

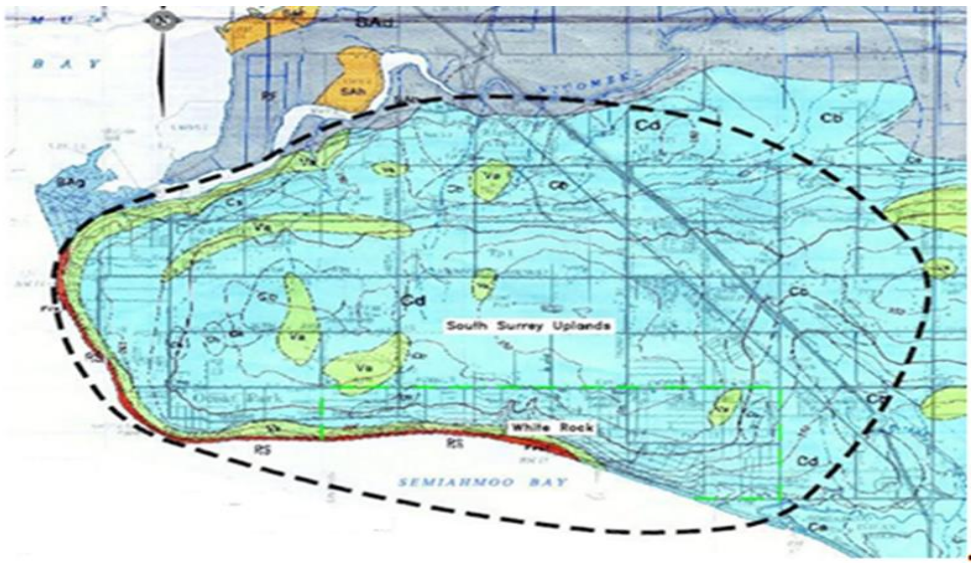


Figure-1, Sunnyside Uplands Aquifer

Water Distribution System

The existing well network includes seven pumping wells located at three different sites as shown in Figure-2.
The wells can provide a combined supply of approximately 15 ML per day. These wells provide adequate water supply for the CoWR community even at peak consumption during the summer months, when consumption can typically rise to 10 ML per day. Wells 1, 2, 3, and 8 are located at the Oxford Site. In previous years well 4 was a seasonal well utilized during the months of June, July and August and is located at High Street. It is now connected to the Water Treatment Plant which provides one common treatment plant for all wells. Wells 6 and 7 are located at the Merklin Site. Well 5 was taken out of service on February 16th, 2017 and Well 8 was constructed in 2018, Figure-2.

Figure-2, City of White Rock Water Wells

Maintenance Programs

The maintenance and day-to-day water operations for the water treatment plant, 2 pumping stations, 3 reservoirs, 80 km of pipes, 7 wells and 355 hydrants are conducted by the staff of the Water Division, Engineering and Municipal Operations, City of White Rock. All the water operators are licensed with the Environmental Operators Certification Program (EOCP). The City has an ongoing preventative maintenance program that includes:

- Operation and maintenance of two pumping stations
- Valve exercising
- Hydrant inspection and servicing
- Flushing of water mains through UDF (uni-directional flushing) program
- Testing and calibration of WTP analyzers
- Regular backwash of filters at the Water Treatment Plant
- Chemicals addition and monitoring
- 2 secondary disinfection systems
- Maintain 3 PRV stations
- Annual full water chemical analysis
- Documentation of the above

Other services include:

- Installation of water services for new home construction
- Water infrastructure repairs and maintenance
- Water quality sampling and testing
- Respond to resident's request and concerns (sampling may be required)
- Water meter maintenance and quarterly reading
- Emergency repairs

Maintenance upgrades during 2020 included:

- 127 water meter replacements
- 6 new fire hydrants
- 36 water service upgrades

Figure-3

Figure-4

Facilities Security

Municipal and private water systems facilities security measures throughout Canada are being elevated to reduce the potential for vandalism or other activities that could impact water quality or water supply to the public.

The Oxford Pumping Station and the Water Treatment Plant were the last facilities that needed to have fencing as additional security measures to be implemented to mitigate the potential for damage.

As part of the City's commitment to water security, the City's Water Division provided in 2018 fencing for the Merklin Pumping Station and Reservoir, Roper Reservoir and the High Street Well 4.

Fencing for the new Water Treatment Plant and the Oxford Pumping Station/Reservoir started in 2019 after the completion of the construction of the Water Treatment Plant (Figure-5). The project was completed in February 2020. The fenced property includes the Water Treatment Plant, Oxford Pumping Station, and 4 Wells (1, 2, 3 & 8).

Figure-5, Fence Construction for the White Rock Oxford Water Facility

Cyber security is a worldwide threat to critical infrastructure. The City has implemented a number of technologies and practices to mitigate cyber security threats and will continue to stay up to date in the current threat environment.

Pressure Monitoring System

Public infrastructure systems are complex, many are underground and therefore difficult to access and inspect. It is standard practice to differentiate between linear assets (pipes, roads, etc.) and non-linear or discrete assets (pumps, plants, etc.) since each category presents different type of management challenges. Providing services to the public requires all the components within a system to perform adequately since the robustness – and therefore the safety and quality of the service is dependent on its certain challenging issues.

Infrastructure assets also have very long service lives – water mains in the distribution are in use in many locations as long as for 80 years, or longer. Pressure is one of the primary optimization parameters for the delivery of safe drinking water. The loss of pressure in the distribution system can potentially allow outside water sources to contaminate the distribution system. Fluctuations in pressure can affect the physical integrity of pipes. Pressure surges are known to generate an increase in leaks, and water main breaks, which affects the service life of the water system. The use of pressure sensors provides a measure of what is occurring along the water distribution pipelines.

Establishing the exposure and sensitivity of infrastructure to threats, whether from extreme climate events, earthquakes, or from uncontrolled activities such as new development, or unlawful use of water hydrants.

The City completed the work on the implementation of a remote pressure monitoring system that was deployed in the water distribution system. The system contains sensors located throughout the high and low pressure zones that relay pressure, temperature, and battery level to a secure web server. These readings are then relayed to the Water Utility SCADA system, which allows the operators to receive real-time information on water pressure.

Unidirectional Flushing Program

Unidirectional Flushing Program (UDF) is an important component of any water utility's routine distribution system maintenance. Flushing removes sediments, deposits, and biofilm build-up from the water distribution system, which improves water quality and leads to less customer complaints. Incorporating unidirectional flushing techniques allows the utility to improve the degree of water main cleaning, reduces the total time it takes to complete the program, and decreases the frequency of flushing. Flushing of the distribution system is important to the maintenance and to the preservation or improvement of water quality and control of bacterial growth. Our operators review the previous year's flushing results to evaluate the run setup for comparison of the outcomes. Results are reviewed on an annual basis to see if less or more frequent flushing is required.

Water main flushing at the City of White Rock has been conducted regularly since 2016 for a variety of reasons, including: corrosion control; sediment removal; taste and odor control; maintain low turbidity; maintain disinfectant residual; and to prevent the potential of bacterial growth. The City has been divided into 3 Areas (Figure-6) to divide the work into manageable areas.

Figure-6, Unidirectional Flushing Areas 1, 2 & 3

There have been significant improvements in the amount of time it takes to complete the program. On average, the time to complete the program has decreased by 30 % over the last 6 UDF Programs .The program has been implemented every year, starting in 2016, in the months of October to December. The program was implemented twice in 2017 in order to have a higher improvement after noticing the results in 2016. After many years of conducting the UDF Program, a significant improvement has been noticed. In addition, since the end of March 2019, the Water Treatment Plant has been delivering a significantly improved water quality with Manganese concentration reduced to below detection limit. Figure-8 shows the results of the UDF program over the last two years. With this reduction, water operators are not having to flush out newer deposits, which in the long term should decrease flushing volumes, duration, and frequency of flushing. Other Factors influencing results include the following:

- Water system upgrades
- System residual levels
- Long-term effect of secondary disinfection
- Less frequent flushing
- Operator errors or run design errors

Area 1

Total Water for flushing Volume, 2019	1300 m^3	Total Water for flushing Volume, 2020	1698 m^3
Time	367 min.	Time	669 min.

Area 2

Total Water for flushing Volume, 2019	3181 m^3	Total Water for flushing Volume, 2020	3930 m^3
Time	1095 min.	Time	1465 min.

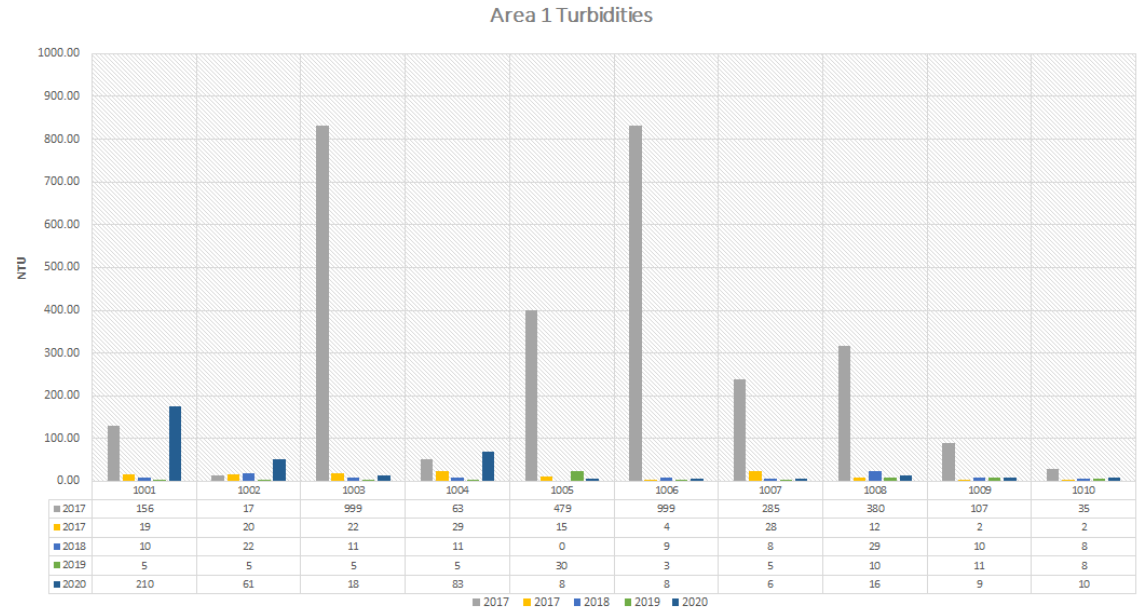
Area 3

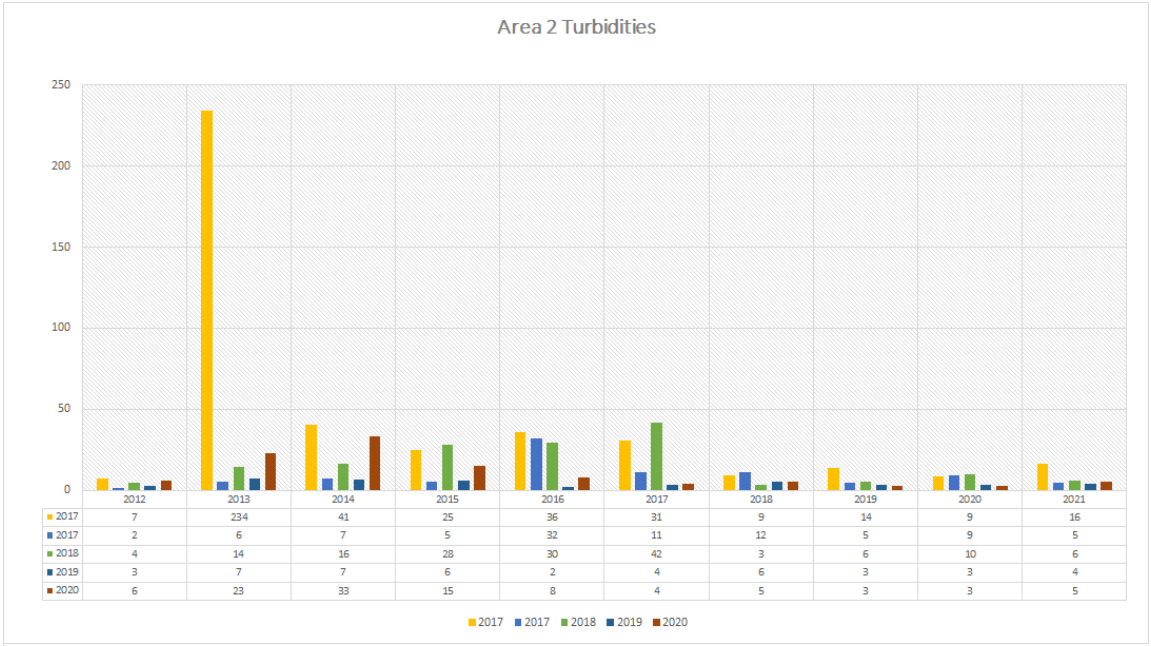
Total Water for flushing Volume, 2019	1421 m^3	Total Water for flushing Volume, 2020	1582 m^3
Time	657 min.	Time	700 min.

Table-1, Volume of Flushing water used and Time comparisons for UDF Program in 2019 and 2020

The cost of the UDF Program is expected to decrease over the long term with a reduction of volume and time. Operators continue to track all the data from the program.

Figure-7, The Water Division Operators conducting the Unidirectional Flushing program





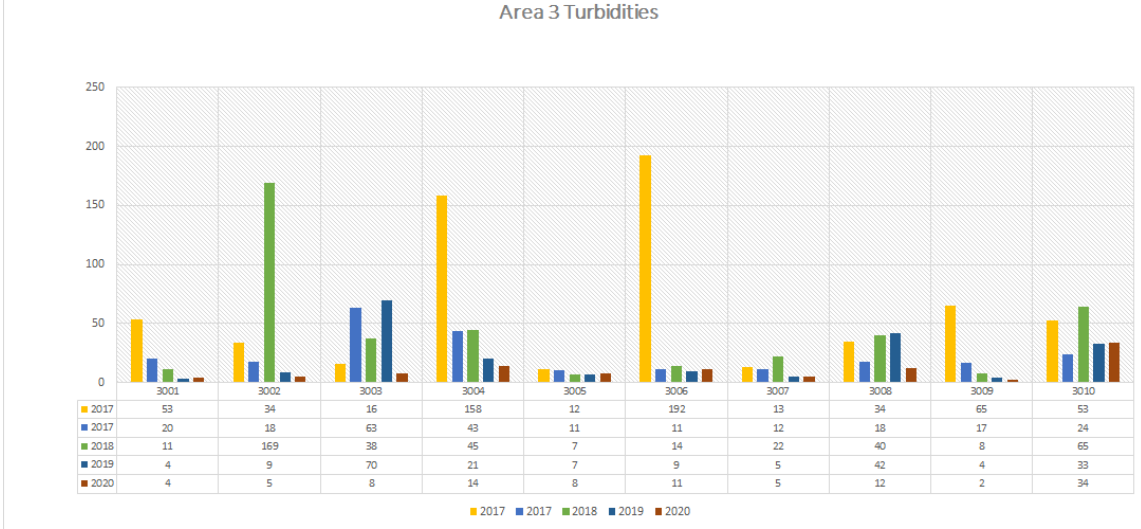


Figure-8, UDF Turbidity Readings

The UDF Program improved the condition of the Distribution System by removing sediment and biofilm, which reduces potential impacts on water quality delivered to the public and reduces the potential of having negative aesthetical impacts on the water delivered. In addition, over the long and short term, the expectation is a reduction of water used and a lower frequency of the flushing program which is an important step in water conservation and in management of water resources considering the relationship between Climate Change and Water Conservation.

New Guidelines for Manganese

(Guidelines for Canadian Drinking Water Quality, Guideline Technical Document Manganese, May 2019)

Manganese occurs naturally in the environment, and is widely distributed in air, water, and soil. Manganese may be present in water in the environment from natural sources (rock and soil weathering) or as a result of human activities (such as mining, industrial discharges, and landfill leaching). It is used in various industries, including in the steel industry, in the manufacture of various products (e.g., fireworks, dry-cell batteries, fertilizers, fungicides and cosmetics and paints). Manganese may also be added to water as an oxidizing agent (permanganate), or as an impurity in coagulants used in the treatment of drinking water.

The recent guideline change for manganese is based on reviews and assesses all identified health risks associated with manganese in drinking water. It incorporates new studies and approaches and takes into consideration the availability of appropriate treatment technology. Based on this review, the drinking water guideline for manganese is a maximum acceptable concentration (MAC) of 0.12 mg/L (120 µg/L), based on infants, the most sensitive population. Although the MAC established is based on infants, this value is intended to protect all Canadians.

-Health effects

Manganese is an essential element for humans. Deficiency is considered unlikely in Canada, as adequate amounts are obtained from food. A non-cancer endpoint was chosen for this assessment as available studies are not adequate to support a link between manganese and cancer. Some studies in humans suggest an association between manganese in drinking water and neurological effects in children; however, they can only be used to support the choice of the key health effect. The effects observed in children are consistent with the neurological effects reported in the key animal studies used to establish the MAC.

-Aesthetic considerations

Concerns regarding the presence of manganese in drinking water are often related to consumer complaints regarding discolored water. The new aesthetic objective (AO) of 0.02 mg/L (20 µg/L) is intended to minimize the occurrence of discolored water complaints based on the presence of manganese oxides and to improve consumer confidence in drinking water quality.

Operation of the Water Treatment Plant

The quality of drinking water is of the utmost importance to the City, which is why regular water testing is conducted. The City of White Rock has taken steps to build a water treatment plant to remove arsenic and manganese, hired in-house experts and consultants who have extensive experience. The City applied for infrastructure grants funding programs by the provincial and federal governments, which is not available to private organizations. The Government of Canada and the Province of British Columbia provided funding from the Clean Water and Wastewater Fund (CWWFA) to the City of White Rock for the “Arsenic and Manganese Water Treatment Project No. C40174.”

As part of the City’s acquisition and operation of the water utility, the City is under mandate by the Fraser Health Authority to implement a secondary form of water disinfection and to reduce the arsenic concentration levels in the drinking water. The work is necessary to treat the water supply to meet the Canadian Drinking Water Guidelines. The completion of the Water Treatment Plant met that requirement being completed in 2019.

The City of White Rock has been successful in maintaining the manganese level below the detection limit in the drinking water leaving the WTP. The City of White Rock introduced ferric chloride coagulation in February 2020 in order to improve the removal of arsenic and phosphate in the Greensand Filters. This reduced the amount of arsenic and phosphate entering the E33 contactors, which helps to extend the E33 filter life.

-Arsenic Analyzer

Arsenic EZ-Analyzer was installed and commissioned in September 2020, which provides Real-Time Arsenic results for Raw water, Post GS+ and Post E33. This helps making changes to the system without any delays. It also helps to compare the Analyzer Data to the analysis done by the Laboratory.

-Water treatment processes and technologies design

The White Rock Water Treatment Plant is designed to treat the City's existing groundwater supplies to remove naturally occurring manganese and arsenic to ensure that an improved drinking water quality is supplied to the residents that meets the guidelines and aesthetic objectives. The plant is built next to the Oxford Pumping Station.

The Water Treatment Plant process is a multi-stage process and includes the following key treatment components:

- Pre-Oxidation with ozone for arsenic and manganese in the raw water supply.
- Removal of manganese using Greensand Plus media filters.
- Removal of arsenic using Bayoxide E33 media filters.

-Ozone pre-oxidation

Research has shown that the application of ozone for water treatment processes can enhance the ability to remove many emerging contaminants and reduce disinfectant byproducts. Ozone, a strong oxidant, is very effective in the oxidation of organic and Inorganic compounds more effectively than chlorine. Arsenic present in groundwater in As(III) form needs to be oxidized to As(V). To have an optimum removal of As(III) which is neutrally charged, it should be oxidized to As(V) which is negatively charged. Strong chemical oxidants like ozone oxidize As(III) very rapidly, thus contact time generally is not a critical factor for optimizing arsenic removal. The simple oxidation reactions between ozone and arsenic, and manganese are as follows:

$$O_3 + H_3AsO_3 = H_2AsO_4^- + O_2 + H^+ \ (@\ pH\ 6.5)$$

$$O3 + H_3AsO_3 = HAsO_4^{2-} + O_2 + 2H^+ \ (@\ pH\ 8.5)$$

$$O_3 + H_2O + Mn^{2+} = MnO_2(s) + 2H^+ + O_2$$

Figure-9

-Manganese and arsenic removal

Manganese removal in groundwater supply has been practiced for many decades. Technology approaches are mature, and improvements in treatment efficiency have been only incremental. The focus on arsenic removal technologies has been increasing due to more emerging evidence of concerns over human exposure risks of arsenic that led to changes of guidelines for arsenic in drinking water. Knowledge of raw water quality is an important factor in the selection of the technology and processes to remove certain organic or inorganic compounds that might interfere in achieving the targeted effluent water quality.

The City of White Rock's groundwater has elevated, naturally occurring arsenic and manganese. The research conducted by the City of White Rock and RES'EAU WaterNet showed that the use of ozone as a pre-oxidant, followed by greensand and adsorption filter media for the removal of manganese and arsenic, respectively, is effective for groundwater sources like White Rock's water supply. NAC/Associated Engineering Team developed the

design to include filtration using Greensand Plus media for manganese reduction, and AdEdge E33 adsorption media, for arsenic polishing to achieve the low target levels required by the City. The use of ozone for pre-oxidation of the arsenic and manganese prior to the two-stage process; filtration and adsorption process were included in the design due to the facts that:

- Many arsenic removal technologies are more effective at removing the pentavalent form of arsenic, arsenate, As(V) than, As(III). Therefore, many treatment systems include a peroxidation step to convert Arsenite, As(III) to Arsenate As(V)
- Ozone can achieve 100% oxidation of As(III) to As(V)
- Oxidation alone does not remove arsenic from solution, and must be coupled with a removal process such as coagulation, adsorption, or ion exchange
- Manganese removal was very effective using ozone followed by Greensand Plus media

-Water treatment objectives

The treatment objectives of the White Rock WTP are to deliver drinking water meeting the following operational targets:

- Mn < 0.02 mg/L
- As < 0.002 mg/L (95% of time, 0.005 mg/L for 5% of operation)

All other water quality parameters shall meet the objectives of the Guidelines for Canadian Water Quality (GCDWQ).

The Water Treatment Plant started operation in March 2019. Water quality improvement was noticeable with removal of arsenic and manganese.

Performance changes to the water treatment plant were monitored closely. The staff of the Water Division worked diligently and tirelessly to investigate the reasons for performance change which resulted in an increase in concentrations of arsenic and manganese in the final treated effluent.

Adjustments were made to initial ozone dosages, monitoring the impact on manganese concentration in the Greensand Plus effluent. Remarkable results were achieved, bringing manganese concentration to below detection limit. Arsenic Speciation was monitored to make sure that process change did not have an impact on arsenic oxidation. The analysis confirmed complete oxidation of As(III) to As(V) at low ozone dosages.

To improve arsenic removal, an introduction of a coagulant was recommended to NAC and AdEdge to improve the removal of arsenic and to bring arsenic level to be within the Design Objectives.

Climate Change Implications

The water quality analysis indicated a significant improvement in drinking water quality supplied to the residents of the City of White Rock after the operation of Water Treatment Plant, many positive comments came from residents who indicated that they are using tap water instead of bottled water, which reduces waste in landfills and plastics pollution in our water sources.

The new Water Treatment Plant delivered drinking water with significantly low manganese, which almost eliminated the addition of manganese to the distribution system. The Unidirectional Flushing (UDF) of the distribution system made a noticeable reduction in deposited manganese in the distribution system, reducing water used for flushing, and the energy used to produce and pump that amount of water.

Figure-10, The Ozone System

Figure-11, The newly constructed White Rock Water Treatment Plant

Communications and Education

Since acquiring the water utility from EPCOR in October of 2015, the City of White Rock has provided unprecedented information to the public on the state of the City's water, including steps the City must take as mandated by Health Canada and the Fraser Health, i.e. providing a secondary disinfection throughout the entire

system, as well as important capital infrastructure work like the new Water Treatment Plant. This information is readily available on the City's website under the Water page, which includes links to various projects and initiatives so the public is aware of City action and plans to address and improve the water quality and communicating with the public.

The City Water Utility requires EOCP Certified Operators to work on the drinking water system. The Water Treatment Plant requires a level 3 certified Operator and a level 4 certified person for the distribution system.

City staff have the following certifications:
Water Treatment Level 4 – 1
Water Treatment Level 2 – 1
Water Treatment Level 1
Water Distribution Level 4 – 1
Water Distribution Level 3
Water Distribution Level 2
Water Distribution Level 1

Water Quality Testing

The City has been consolidating all the testing data from January to December 2020. This data is included in Appendix-B: City of White Rock Water Quality Testing for 2020. In addition, testing data is updated regularly on the City of White Rock's website: www.whiterockcity.ca/300/Water-Quality.

Water Utility staff perform in-house testing for various compounds. They performed 720 E-coli and 720 bacteriological tests during 2020.

The City conducted 405 individual tests for arsenic, copper, iron, lead and manganese throughout 2020 for routine sampling from sample stations and reservoirs. 192 individual tests were conducted for; Chloroform, Bromodichloromethane, Dibromochloromethane, Bromoform, Total THMs, Dibromofluoromethane, Toluene-d8, Bromofluorobenzene, Monochloroacetic Acid, Monobromoacetic Acid, Dichloroacetic Acid, Bromochloroacetic Acid, Dibromoacetic Acid, Trichloroacetic Acid and Total HAA6 throughout 2020.

The City also recommends to residents anytime the water in a particular faucet has not been used, to flush the cold-water pipes by running the water until you notice a change in temperature. This could take a short time if there has been recent heavy water use such as showering or toilet flushing. The more time water has been sitting in your home's pipes, the more manganese it may contain.

Conserving water is still important. Rather than just running the water down the drain, residents could use the water for their plants, garden, or lawn.

Water Consumption

Water consumption patterns are tracked to ensure that the White Rock system continues to provide sufficient water services to customers. Annual, monthly water consumptions and the highest daily consumption (peak day) are shown below, Table-2 and Figure-12.

Annual Water Consumption

2020 Water Consumption (ML)*	
Total Potable Water Produced	2,394.7

Max. Day (July 31)	9.4
Annual Average Daily Consumption	6.6

* Million Liters

Table-2, Total Annual Water Consumption

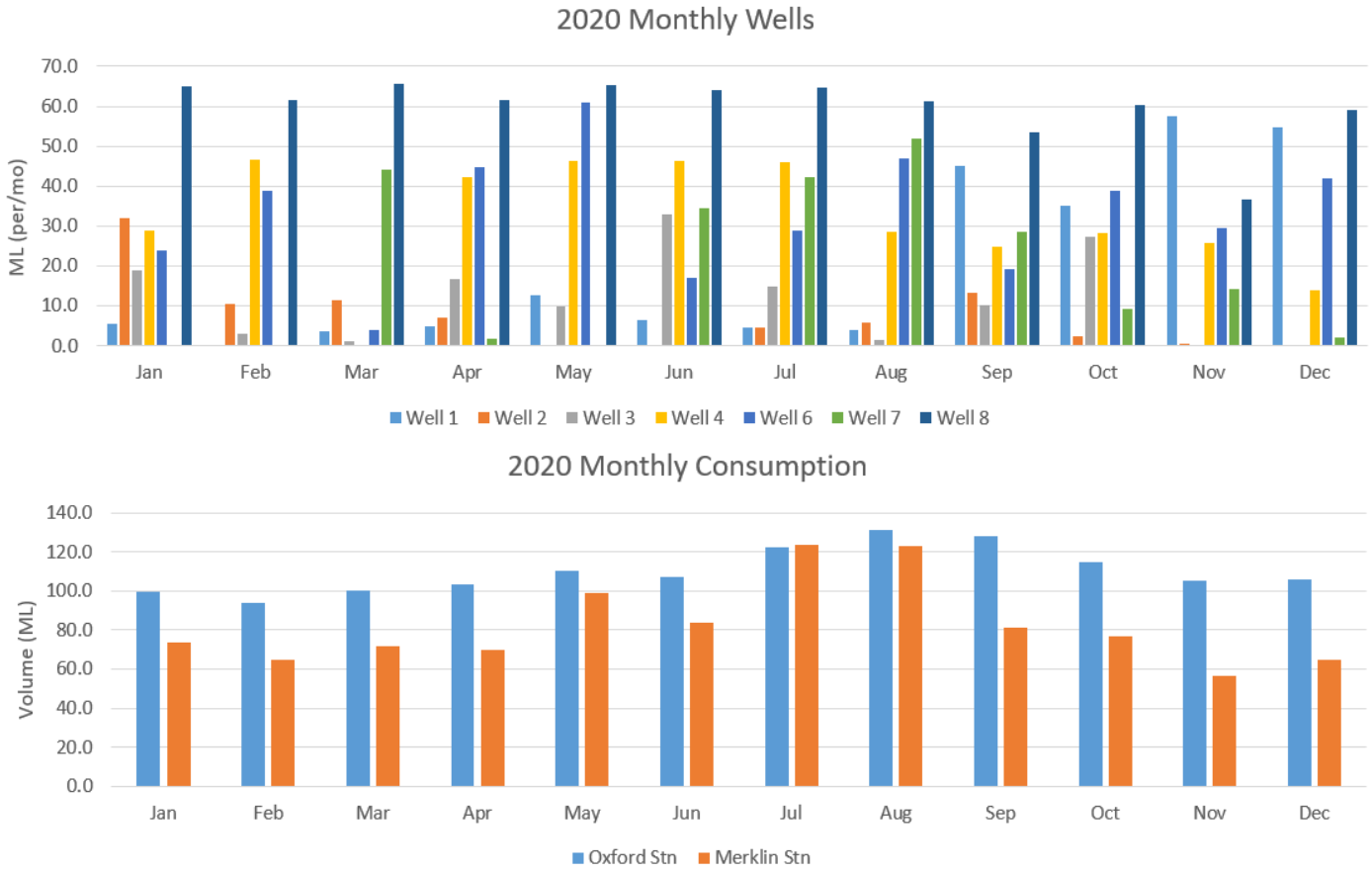


Figure-12, Water Consumption

Storage Capacity

The storage requirements for forecasted demands are as shown in the following table. It is noted that the 16% value for balancing storage is based on past studies estimating the specific balancing requirement needs for the City of White Rock's system (Kerr Wood Leidal, 2010).

The available storage capacity was provided in the 2017 Water Master Plan Update.

Required Balancing Storage:	12.4 MLD (144 L/s) x 16%	= 1.99 ML
Required Fire Storage:	212 L/s for 2.6 hours	= 1.98 ML
Required Emergency Storage:	25% of above storage	= 0.99 ML
Total Required		**= 4.96 ML**
Available Storage:	Merklin Reservoirs	= 3.01 ML
	Oxford Reservoir	= 1.95 ML
	Roper Reservoir (Low Zone)	= 1.14 ML
Total Available		**= 6.10 ML**
Excess Available for Pump Cycling		**= 1.14 ML**

Table-3, Balancing Storage Required Versus Available

Capital Projects

-Completion of the Water Treatment Plant

The Water Treatment Plant came into operation at the end of March 2019, providing significantly improved water quality to the residents of the City of White Rock. NAC Constructors and City staff have been working to resolve any issues found during the operation of the plant.

During 2020 Water Division staff have been optimizing the process to improve reliability to the fully automated facility.

-Roper Reservoir Design Upgrade

Tybo Constructors was awarded the contract to modify the inlet for the reservoir in October 2019. This work added a dedicated inlet pipe to circulate the water which improves water quality. A structural assessment of the reservoir was also done so that additional work inside the reservoir (to extend its life) could be completed while the reservoir was out of service.

Figure-13

-Pipe Bursting of Watermain in 15100 Block Marine Drive

Replacement of 130m of 150mm cast iron watermain was grouped with other storm and sanitary work in the same area to achieve cost savings. The watermain was replaced using pipe bursting technology to install a 150mm HDPE with additional valves that were not previously available. This was a innovative approach and was successful in execution and brought benefits to the City via GHG rebates and less disruption to the immediate residents that would have been affected if we executed the project via traditional cut and cover means (open excavation).

-Oxford Water Facility Fencing

Installed perimeter fencing for the Oxford Water Facilities that encompasses 4 wells, reservoir, pump station and the water treatment plant. Through consultations with residents the fencing alignment was changed to include provisions for a green space and a walkway between Goggs Avenue and Oxford Street.

Figure-14

-Brearley Street Watermain Extension

The dead end watermain in the 1500 block of Brearley Street was extended to the 200mm diameter watermain along North Bluff Road. This will improve circulation of treated water which improves water quality and reduces staff time to flush the dead end watermain.

Figure-15

-Well Upgrades

The Oxford well field programmable logic controller (PLC) was upgraded to provide additional input/outputs for controlling each well's variable frequency drives (VFD). The well pumps push the water through the entire treatment process, through to the reservoirs. Being able to automatically adjust the variable motor speeds will be easier on the equipment and provide individual control based on each well's operating characteristic such as ground water draws down, pressure, etc.

Emergency Response Action Plan

The City has an emergency response plan in case the water supply is interrupted for any reason. There are procedures that City water operators follow whether it is a major or minor problem.
The Emergency Response Plan Action Plan follows five general steps:

1. Analyze the type and severity of the emergency;
2. Take any action needed to save lives;
3. Take action to reduce system damage and injuries and reduce environmental damage;
4. According to priority demand, make appropriate repairs, and
5. Return the system to normal operation.

The Emergency Response Plan was updated in 2019 to the City of White Rock website.

Next Steps for 2021

- Continue the optimization of the Water Treatment Plant processes
- Complete the 2020 approved Capital Works projects
- Work on the 2021 Capital Works projects
- Maintain the improvement and upgrade for the water distribution system
- Provide the training for the Water Operators to have them update/upgrade their licenses
- Work with Communication Department and the IT Department to maintain updated information on the website

Summary

The City of White Rock has now owned the water utility for four full years. During 2020 City staff worked on engaging the community and explained steps taken to improve the City's water quality with the addition of a new water treatment plant for the arsenic and manganese removal.

During the year of 2020, staff collected and sent samples for water quality testing.
The City completed the full implementation of secondary disinfection to the distribution system, and reducing the arsenic and manganese in the drinking water, meeting the requirements of the Permit to Operate by Fraser Health. The City continues to monitor the levels of arsenic and manganese and will be informing the community on the solutions to reduce the level of arsenic and manganese from the data provided from the operation of the water treatment plant which is made available on the City of White Rock web site.

Appendix A
Fraser Health Permit to Operate

fraserhealth HEALTH PROTECTION

PERMIT
TO OPERATE
A Drinking Water System with
301-10000 Connections

Water Supplier: Corporation of the City of White Rock, The
Facility Name: City of White Rock Water System

CONDITIONS OF PERMIT:

1. The drinking water must be treated to provide an acceptable secondary disinfectant to the whole system that meets requirements of the Guidelines for Canadian Drinking Water Quality and is acceptable to Fraser Health Authority.
2. Arsenic and Manganese levels of the treated water must be monitored on a quarterly basis as a minimum. The results are to be provided to Fraser Health.
3. By June 30, 2021, the City of White Rock must have a Level III certified water treatment operator. The operator must be certified by Environmental Operators Certification Program (EOCP). As an interim measure, the City must have Level II certified operator and maintenance or repair of the treatment system must be conducted following proce res approved by a person certified by EOCP.

21-Aug-2019
Effective Date

Environmental Health Officer

fraserhealth
Expires March 31 2020
772205

This permit must be displayed in a conspicuous place and is nontransferable

PRINTSHOP #261332 REV:24APR06.OW

Appendix B
City of White Rock Water Quality Testing Results
January-December 2020

Bacterial Results - 2020

Microbioligical Analysis MPN / 100mL	Date	Guideline Limit 0 per 100 ml	# of Samples	Pass	Fail	Guideline Comments
Total Coliforms	06-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	06-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	07-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	07-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	13-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	13-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	14-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	14-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	21-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	21-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	22-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	22-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	28-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	28-Jan-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	03-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	03-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	04-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	04-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	11-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	11-Feb-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	18-Feb-20	0 per 100 mL	13	13	0	Below Guideline
Escherichia Coli	18-Feb-20	0 per 100 mL	13	13	0	Below Guideline
Total Coliforms	25-Feb-20	0 per 100 mL	13	13	0	Below Guideline
Escherichia Coli	25-Feb-20	0 per 100 mL	13	13	0	Below Guideline
Total Coliforms	03-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Escherichia Coli	03-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Total Coliforms	09-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Escherichia Coli	09-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Total Coliforms	16-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Escherichia Coli	16-Mar-20	0 per 100 mL	13	13	0	Below Guideline
Total Coliforms	23-Mar-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	23-Mar-20	0 per 100 mL	6	6	0	Below Guideline
Total Coliforms	24-Mar-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	24-Mar-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	30-Mar-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	30-Mar-20	0 per 100 mL	6	6	0	Below Guideline
Total Coliforms	31-Mar-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	31-Mar-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	06-Apr-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	06-Apr-20	0 per 100 mL	6	6	0	Below Guideline

Total Coliforms	07-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	07-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	14-Apr-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	14-Apr-20	0 per 100 mL	6	6	0	Below Guideline
Total Coliforms	15-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	15-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	20-Apr-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	20-Apr-20	0 per 100 mL	6	6	0	Below Guideline
Total Coliforms	21-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	21-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	27-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	27-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	28-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	28-Apr-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	04-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	04-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	05-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	05-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	11-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	11-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	12-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	12-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	19-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	19-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	20-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	20-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	25-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	25-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	26-May-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	26-May-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	01-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	01-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	02-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	02-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	08-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	08-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	15-Jun-20	0 per 100 mL	7	6	1	Above Guideline*
Escherichia Coli	15-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	16-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	16-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	22-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	22-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	23-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	23-Jun-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	29-Jun-20	0 per 100 mL	9	8	1	Above Guideline**

Escherichia Coli	29-Jun-20	0 per 100 mL	9	9	0	Below Guideline
Total Coliforms	06-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	06-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	07-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	07-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	13-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	13-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	14-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	14-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	20-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	20-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	21-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	21-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	27-Jul-20	0 per 100 mL	7	6	1	Above Guideline***
Escherichia Coli	27-Jul-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	28-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	28-Jul-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	04-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	04-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	05-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	05-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	10-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	10-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	11-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	11-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	17-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	17-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	18-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	18-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	24-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	24-Aug-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	25-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	25-Aug-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	03-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	03-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	05-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	05-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	09-Sep-20	0 per 100 mL	9	9	0	Below Guideline
Escherichia Coli	09-Sep-20	0 per 100 mL	9	9	0	Below Guideline
Total Coliforms	10-Sep-20	0 per 100 mL	6	6	0	Below Guideline
Escherichia Coli	10-Sep-20	0 per 100 mL	6	6	0	Below Guideline
Total Coliforms	14-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	14-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	15-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	15-Sep-20	0 per 100 mL	8	8	0	Below Guideline

Total Coliforms	21-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	21-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	22-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	22-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	28-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	28-Sep-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	29-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	29-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	05-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	05-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	06-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	06-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	29-Sep-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	13-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	13-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	13-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	13-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	19-Oct-20	0 per 100 mL	15	N/A	N/A	****
Escherichia Coli	19-Oct-20	0 per 100 mL	15	N/A	N/A	****
Total Coliforms	26-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	26-Oct-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	27-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	27-Oct-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	02-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	02-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	03-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	03-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	11-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	11-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	16-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	16-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	17-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	17-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	23-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	23-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	24-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	24-Nov-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	30-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	30-Nov-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	01-Dec-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	01-Dec-20	0 per 100 mL	8	8	0	Below Guideline
Total Coliforms	07-Dec-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	07-Dec-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	08-Dec-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	08-Dec-20	0 per 100 mL	8	8	0	Below Guideline

Total Coliforms	14-Dec-20	0 per 100 mL	7	7	0	Below Guideline
Escherichia Coli	14-Dec-20	0 per 100 mL	7	7	0	Below Guideline
Total Coliforms	15-Dec-20	0 per 100 mL	8	8	0	Below Guideline
Escherichia Coli	15-Dec-20	0 per 100 mL	8	8	0	Below Guideline
.	**TOTALS**		1368	1335	3	

*June 15 - Unable to obtain Coliform count. Re-test on June 18 showed no coliforms. Re-test results located under "Non-Routine" report.

** June 29 - Unable to obtain Coliform count. Re-test on July 2 showed no coliforms. Re-test results located under "Non-Routine" report.

*** July 27 - Re-test on July 30 showed no coliforms. Re-test results located under "Non-Routine" report.

**** October 19 - Samples delayed at Fraser Health – transit time exceeded – testing rejected

Water Treatment Plant Metal Results 2020

Sample Location	Date Sampled	Arsenic µg/L	Copper µg/L	Lead µg/L	Iron µg/L	Manganese µg/L	Colour Colour Units	pH
Guideline Limit		**10**	**2000**	**5**	**300**	**120**		**7.0-10.5**
WTP - Raw Water	**06-Jan-20**	**6.7**	**<0.5**	**0.01**	**5**	**110**	**<5**	**8.05**
Treated Water	06-Jan-20	4.0	<0.5	<0.01	<4	<1	<5	8.10
WTP - Raw Water	**13-Jan-20**	**7.3**	**<0.5**	**<0.01**	**<4**	**120**	**<5**	**7.98**
Treated Water	13-Jan-20	4.4	<0.5	<0.01	<4	<1	<5	8.04
WTP - Raw Water	**21-Jan-20**	**5.5**	**<0.5**	**<0.01**	**5**	**140**	**<5**	**7.94**
Treated Water	21-Jan-20	4.3	<0.5	<0.01	<4	<1	<5	8.06
WTP - Raw Water	**28-Jan-20**	**5.2**	**2.3**	**<0.01**	**<4**	**170**	**<5**	**8.02**
Treated Water	28-Jan-20	3.7	<0.5	<0.01	<4	<1	<5	8.14
WTP - Raw Water	**07-Feb-20**	**6.2**	**N/A**	**N/A**	**3**	**160**	**N/A**	**8.02**
Treated Water	07-Feb-20	3.2	N/A	N/A	<2	<1	N/A	7.98
WTP - Raw Water	**07-Feb-20**	**6.0**	**N/A**	**N/A**	**2**	**130**	**N/A**	**7.98**
Treated Water	07-Feb-20	3.3	N/A	N/A	<2	<1	N/A	7.98
WTP - Raw Water	**07-Feb-20**	**6.1**	**N/A**	**N/A**	**<2**	**160**	**N/A**	**8.02**
Treated Water	07-Feb-20	3.4	N/A	N/A	<2	<1	N/A	7.98
WTP - Raw Water	**08-Feb-20**	**4.8**	**N/A**	**N/A**	**2**	**170**	**N/A**	**8.01**
Treated Water	08-Feb-20	2.9	N/A	N/A	3	<1	N/A	8.01
WTP - Raw Water	**08-Feb-20**	**5.8**	**N/A**	**N/A**	**2**	**120**	**N/A**	**8.02**
Treated Water	08-Feb-20	2.9	N/A	N/A	3	<1	N/A	8.12
WTP - Raw Water	**09-Feb-20**	**5.8**	**N/A**	**N/A**	**2**	**120**	**N/A**	**8.02**
Treated Water	09-Feb-20	2.6	N/A	N/A	<2	<1	N/A	8.13
WTP - Raw Water	**19-Feb-20**	**5.6**	**N/A**	**N/A**	**12**	**120**	**N/A**	**7.82**
Treated Water	19-Feb-20	3.1	N/A	N/A	3	<1	N/A	7.87
WTP - Raw Water	**19-Feb-20**	**5.4**	**N/A**	**N/A**	**2**	**120**	**N/A**	**7.88**
Treated Water	19-Feb-20	3.1	N/A	N/A	3	<1	N/A	7.86
WTP - Raw Water	**20-Feb-20**	**5.8**	**N/A**	**N/A**	**<2**	**150**	**N/A**	**8.02**
Treated Water	20-Feb-20	2.6	N/A	N/A	6	<1	N/A	8.00
WTP - Raw Water	**06-Mar-20**	**6.2**	**1.9**	**<0.01**	**<4**	**150**	**<5**	**8.08**
Treated Water	06-Mar-20	2.7	<0.5	<0.01	<4	<1	<5	8.14
WTP - Raw Water	**16-Mar-20**	**6.3**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**8.06**

Treated Water	16-Mar-20	2.6	<0.5	<0.01	<4	<1	<5	8.16
WTP - Raw Water	19-Mar-20	**5.7**	**1.7**	**<0.01**	**13**	**130**	**<5**	**7.96**
Treated Water	19-Mar-20	2.5	<0.5	<0.01	5	<1	<5	8.03
WTP - Raw Water	23-Mar-20	**5.9**	**14.3**	**0.20**	**15**	**160**	**<5**	**8.07**
Treated Water	23-Mar-20	2.3	<0.5	<0.01	<4	<1	<5	8.06
WTP - Raw Water	30-Mar-20	**6.1**	**<0.5**	**0.01**	**5**	**160**	**<5**	**7.99**
Treated Water	30-Mar-20	2.3	<0.5	<0.01	<4	<1	<5	8.07
WTP - Raw Water	03-Apr-20	**6.4**	**<0.5**	**<0.01**	**<4**	**150**	**<5**	**8.15**
Treated Water	03-Apr-20	2.3	<0.5	<0.01	<4	<1	<5	8.17
Treated Water	08-Apr-20	2.4	N/A	N/A	N/A	<1	N/A	N/A
WTP - Raw Water	16-Apr-20	**6.1**	**<0.5**	**0.02**	**<4**	**150**	**<5**	**8.03**
Treated Water	16-Apr-20	2.6	<0.5	<0.01	<4	<1	<5	8.07
WTP - Raw Water	21-Apr-20	**6.3**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**8.05**
Treated Water	21-Apr-20	2.9	<0.5	<0.01	<4	<1	<5	8.09
WTP - Raw Water	27-Apr-20	**6.6**	**<0.5**	**0.01**	**<4**	**160**	**<5**	**8.07**
Treated Water	27-Apr-20	3.1	<0.5	<0.01	<4	<1	<5	8.12
WTP - Raw Water	07-May-20	**6.0**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**7.93**
Treated Water	07-May-20	2.9	<0.5	<0.01	<4	<1	<5	7.98
WTP - Raw Water	11-May-20	**6.0**	**<0.5**	**0.01**	**<4**	**170**	**<5**	**7.88**
Treated Water	11-May-20	2.7	<0.5	<0.01	<4	<1	<5	7.81
WTP - Raw Water	25-May-20	**6.3**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**8.08**
Treated Water	25-May-20	3.5	<0.5	<0.01	<4	2	<5	8.13
WTP - Raw Water	25-May-20	**6.3**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**8.08**
Treated Water	25-May-20	2.6	<0.5	<0.01	<4	<1	<5	8.13
WTP - Raw Water	02-Jun-20	**6.1**	**<0.5**	**<0.01**	**<4**	**170**	**<5**	**8.14**
Treated Water	02-Jun-20	2.6	<0.5	<0.01	<4	<1	<5	8.08
WTP - Raw Water	08-Jun-20	**6.2**	**<0.5**	**<0.01**	**15**	**160**	**<5**	**8.10**
Treated Water	08-Jun-20	2.8	<0.5	<0.01	<4	<1	<5	8.08
WTP - Raw Water	24-Jun-20	**6.5**	**<0.5**	**<0.01**	**<4**	**160**	**<5**	**7.84**
Treated Water	24-Jun-20	2.9	<0.5	<0.01	<4	<1	<5	8.05
WTP - Raw Water	30-Jun-20	**6.4**	**<0.5**	**<0.01**	**4**	**160**	**<5**	**7.95**
Treated Water	30-Jun-20	2.8	<0.5	<0.01	17	<1	<5	7.84
WTP - Raw Water	13-Jul-20	**6.0**	**<0.5**	**<0.01**	**<4**	**180**	**<5**	**7.94**
Treated Water	13-Jul-20	2.6	0.6	0.05	<4	<1	<5	8.01

WTP - Raw Water	20-Jul-20	**6.1**	**<0.5**	**<0.01**	**<4**	**150**	**<5**	**7.96**
Treated Water	20-Jul-20	2.6	0.6	0.03	<4	<1	<5	8.04
WTP - Raw Water	27-Jul-20	**6.2**	**<0.5**	**<0.01**	**<4**	**140**	**<5**	**7.95**
Treated Water	27-Jul-20	2.6	<0.5	0.01	<4	<1	<5	8.02
WTP - Raw Water	20-Aug-20	**7.2**	**<0.5**	**<0.01**	**<4**	**130**	**<5**	**7.94**
Treated Water	20-Aug-20	0.1	1.0	0.05	<4	<1	<5	8.05
WTP - Raw Water	31-Aug-20	**6.9**	**<0.5**	**<0.01**	**<4**	**120**	**<5**	**7.90**
Treated Water	31-Aug-20	0.2	<0.5	0.01	<4	<1	<5	8.01
WTP - Raw Water	14-Sep-20	**5.9**	**<0.5**	**<0.01**	**5**	**140**	**<5**	**7.93**
Treated Water	14-Sep-20	0.2	0.5	<0.01	<4	<1	<5	8.00
WTP - Raw Water	06-Oct-20	**6.1**	**<0.5**	**<0.01**	**<4**	**130**	**<5**	**7.97**
Treated Water	06-Oct-20	0.7	<0.5	<0.01	<4	<1	<5	8.13
WTP - Raw Water	26-Oct-20	**6.2**	<0.5	**<0.01**	**<4**	**120**	**<5**	**7.93**
Treated Water	26-Oct-20	1.0	<0.5	0.01	<4	<1	<5	8.00
WTP - Raw Water	10-Nov-20	**6.1**	<0.5	**<0.01**	**<4**	**100**	**<5**	**7.88**
Treated Water	10-Nov-20	1.1	<0.05	<0.01	<4	<1	<5	8.00
WTP - Raw Water	07-Dec-20	**7.1**	<0.5	**<0.01**	**<4**	**130**	**<5**	**8.04**
Treated Water	07-Dec-20	1.3	<0.5	<0.01	<4	<1	<5	8.05
Guideline Limit		**10.0**	**2000**	**5**	**300**	**120**		**7.0-10.5**

Raw Water is the untreated water that has been combined from the wells throughout the city. It has been identified in bold.

Metal Results - 2020

Sample Location	Date Sampled	Arsenic mg/L	Copper mg/L	Lead mg/L	Iron mg/L	Manganese mg/L
Customer Concern - 01	9-Jun-20	0.0027	0.0150	0.00032	<0.004	<0.001
	Nominal Detection Limit	**0.0001**	**0.0005**	**0.00001**	**0.004**	**0.001**
	Guideline Limit	**0.010**	**1.0**	**0.005**	**0.3**	**0.05**

Distribution Metal Results 2020

Sample Location	Date Sampled	Arsenic µg/L	Copper µg/L	Lead µg/L	Iron µg/L	Manganese µg/L	Colour Colour Units	pH
Guideline Limit		**10**	**2000**	**5**	**300**	**120**		**7.0-10.5**
Everall Sample Station	27-Jan-20	4.1	1.6	0.06	<4	<1	<5	8.09
Malabar Sample Station	27-Jan-20	4.2	3.5	0.19	7	2	<5	8.09
Chestnut Sample Station	27-Jan-20	4.2	1.2	0.03	12	3	<5	8.09
Russell Avenue Sample Station	27-Jan-20	4.2	1.2	0.06	<4	<1	<5	8.06
Roper Reservoir*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roper PRV	27-Jan-20	4.2	0.5	0.02	<4	<1	<5	8.09
Stevens Sample Station	27-Jan-20	4.2	3.5	0.11	<4	<1	<5	8.08
Roper Ave Station	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Finlay Station	28-Jan-20	3.9	1.0	0.02	9	<1	<5	8.11
Stayte Road Station	28-Jan-20	4.0	3.7	0.28	<4	<1	<5	8.12
Balsam & Marine Station	28-Jan-20	3.8	1.1	0.07	12	1	<5	8.11
Oxford & Buena Vista Station	28-Jan-20	3.8	12.5	0.32	5	2	<5	8.12
Merklin Low Reservoir	28-Jan-20	3.9	31.4	0.04	8	<1	<5	8.12
Merklin New Reservoir	28-Jan-20	3.9	<0.5	<0.01	<4	<1	<5	8.13
Oxford Reservoir	28-Jan-20	3.9	9.7	0.08	6	<1	<5	8.11
Everall Sample Station	02-Mar-20	2.7	1.5	0.10	<4	<1	<5	8.04
Malabar Sample Station	02-Mar-20	2.8	3.6	0.23	<4	2	<5	8.11
Chestnut Sample Station	02-Mar-20	2.8	1.9	0.06	12	5	<5	8.09
Russell Avenue Sample Station	02-Mar-20	2.8	1.1	0.08	<4	<1	<5	8.12
Roper Reservoir*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roper PRV	02-Mar-20	2.9	1.6	0.10	<4	<1	<5	8.15
Stevens Sample Station	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Roper Ave Station	02-Mar-20	2.9	5.7	0.25	<4	1	<5	8.16
Finlay Station	02-Mar-20	2.9	1.2	0.03	<4	1	<5	8.11
Stayte Road Station	02-Mar-20	3.0	4.4	0.30	<4	1	<5	8.13
Balsam & Marine Station	02-Mar-20	2.8	1.8	0.10	<4	2	<5	8.14
Oxford & Buena Vista Station	02-Mar-20	2.8	15.1	0.35	<4	5	<5	8.15
Merklin Low Reservoir	02-Mar-20	3.0	61.6	1.93	46	1	<5	7.93
Merklin New Reservoir	02-Mar-20	3.0	<0.5	<0.01	<4	<1	<5	8.13
Oxford Reservoir	02-Mar-20	2.8	8.9	0.09	<4	<1	<5	8.17
Everall Sample Station	23-Mar-20	2.2	1.0	0.06	<4	<1	<5	8.07
Malabar Sample Station	23-Mar-20	3.0	<0.5	<0.01	<4	2	<5	7.85
Chestnut Sample Station	23-Mar-20	2.3	1.6	0.04	5	4	<5	8.00
Russell Avenue Sample Station	23-Mar-20	2.3	1.4	0.09	<4	<1	<5	8.01
Roper Reservoir*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roper PRV	23-Mar-20	2.3	0.7	0.04	<4	<1	<5	8.06

Stevens Sample Station	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Roper Ave Station	23-Mar-20	2.4	4.7	0.22	<4	1	<5	8.07
Finlay Station	24-Mar-20	2.2	0.9	0.15	<4	<1	<5	7.95
Stayte Road Station	24-Mar-20	2.3	4.9	0.29	<4	1	<5	8.06
Balsam & Marine Station	24-Mar-20	2.2	1.4	0.11	<4	2	<5	8.04
Oxford & Buena Vista Station	24-Mar-20	2.3	8.6	0.26	<4	6	<5	8.06
Merklin Low Reservoir	24-Mar-20	2.2	30.8	0.08	<4	<1	<5	8.08
Merklin New Reservoir	24-Mar-20	2.3	<0.5	<0.01	<4	<1	<5	8.10
Oxford Reservoir	24-Mar-20	2.1	11.4	0.12	<4	<1	<5	8.10
Everall Sample Station	27-Apr-20	3.2	1.3	0.05	<4	<1	<5	7.99
Mann Park Station	27-Apr-20	3.2	4.8	0.12	<4	2	<5	8.05
Marine Drive Station	27-Apr-20	3.0	4.0	0.19	<4	3	<5	8.05
Russell Avenue Sample Station	27-Apr-20	3.3	1.2	0.08	<4	<1	<5	8.06
Roper Reservoir	27-Apr-20	3.1	1.6	0.10	<4	<1	<5	8.81
Roper PRV	27-Apr-20	3.2	2.6	0.06	8	<1	<5	8.10
Stevens Sample Station	27-Apr-20	3.3	2.9	0.12	<4	<1	<5	8.08
Finlay Station	28-Apr-20	3.3	0.9	0.02	<4	<1	<5	7.99
Stayte Road Station	28-Apr-20	3.3	4.3	0.32	<4	<1	<5	8.08
Balsam & Marine Station	28-Apr-20	3.3	1.0	0.12	<4	<1	<5	8.31
Oxford & Buena Vista Station	28-Apr-20	3.4	12.0	0.46	<4	<1	<5	8.00
Merklin Low Reservoir	28-Apr-20	3.2	29.0	0.06	7	10	<5	8.14
Merklin New Reservoir	28-Apr-20	3.4	<0.5	<0.01	<4	<1	<5	8.13
Oxford Reservoir	28-Apr-20	3.2	14.0	0.11	5	<1	<5	8.11
Everall Sample Station	28-May-20	2.6	1.5	0.14	<4	<1	<5	8.01
Mann Park Station	28-May-20	2.5	2.0	0.09	<4	2	<5	8.10
Marine Drive Station	28-May-20	2.5	3.9	0.21	<4	3	<5	8.08
Russell Avenue Sample Station	28-May-20	2.5	0.8	0.08	<4	<1	<5	8.10
Roper Reservoir	28-May-20	2.6	1.3	0.11	<4	<1	<5	8.10
Roper PRV	28-May-20	2.6	34.0	0.13	<4	2	<5	8.12
Stevens Sample Station	28-May-20	2.5	2.5	0.16	<4	<1	<5	8.12
Finlay Station	28-May-20	2.6	0.8	0.03	<4	<1	<5	8.15
Stayte Road Station	28-May-20	2.5	4.5	0.35	<4	2	<5	8.12
Balsam & Marine Station	28-May-20	2.6	1.0	0.11	<4	<1	<5	8.12
Oxford & Buena Vista Station	28-May-20	2.6	16.0	0.34	<4	2	<5	8.12
Merklin Low Reservoir	28-May-20	2.7	33.0	0.07	<4	<1	<5	8.11
Merklin New Reservoir	28-May-20	2.6	<0.5	<0.01	<4	<1	<5	8.15
Oxford Reservoir	28-May-20	2.7	20.0	0.53	28	<1	<5	8.16
Everall Sample Station	29-Jun-20	2.9	1.7	0.11	<4	4	<5	7.92
Malabar Station	29-Jun-20	2.9	4.4	0.39	<4	4	<5	8.03
Chestnut & North Bluff Station	29-Jun-20	2.9	0.8	0.05	9	8	<5	8.04

Russell Avenue Sample Station	29-Jun-20	2.9	1.6	0.11	11	2	<5	8.08
Roper Reservoir	29-Jun-20	3.0	0.8	0.10	<4	5	<5	8.10
Roper PRV	29-Jun-20	2.9	1.3	0.08	18	3	<5	8.08
Roper Ave Station	29-Jun-20	2.9	7.5	0.54	12	2	<5	8.08
Finlay Station	29-Jun-20	2.9	1.3	0.10	<4	4	<5	8.06
Stayte Road Station	29-Jun-20	2.9	5.4	0.46	<4	7	<5	8.07
Balsam & Marine Station	29-Jun-20	2.9	1.4	0.16	<4	<1	<5	7.87
Museum Station	29-Jun-20	3.0	3.7	0.03	<4	6	<5	8.05
Oxford & Buena Vista Station	29-Jun-20	2.9	21.0	0.58	<4	4	<5	8.10
Merklin Low Reservoir	29-Jun-20	2.9	36.0	0.06	6	3	<5	8.11
Merklin New Reservoir	29-Jun-20	2.9	<0.5	<0.01	16	2	<5	8.08
Oxford Reservoir	29-Jun-20	2.9	16.0	0.19	<4	<1	<5	7.98
Everall Sample Station	27-Jul-20	2.6	1.2	0.09	<4	<1	<5	8.05
Malabar Station	27-Jul-20	2.7	4.8	0.31	<4	2	<5	8.06
Chestnut & North Bluff Station	27-Jul-20	2.5	1.1	0.05	<4	4	<5	8.09
Russell Avenue Sample Station	27-Jul-20	2.6	1.4	0.09	<4	<1	<5	8.09
Roper Reservoir	27-Jul-20	2.7	0.9	0.11	<4	<1	<5	8.08
Roper PRV	27-Jul-20	2.7	1.7	0.13	<4	<1	<5	8.08
Stevens Sample Station	27-Jul-20	2.6	3.7	0.20	<4	<1	<5	8.09
Finlay Station	28-Jul-20	2.8	0.9	0.04	<4	<1	<5	7.97
Stayte Road Station	28-Jul-20	2.7	5.2	0.47	5	2	<5	8.04
Balsam & Marine Station	28-Jul-20	2.7	1.6	0.26	4	<1	<5	8.06
Museum Station	28-Jul-20	2.7	4.2	0.01	<4	<1	<5	8.06
Oxford & Buena Vista Station	28-Jul-20	2.6	19.0	0.56	<4	2	<5	8.05
Merklin Low Reservoir	28-Jul-20	2.8	31.0	0.04	<4	<1	<5	8.05
Merklin New Reservoir	28-Jul-20	2.8	0.6	<0.01	<4	<1	<5	8.06
Oxford Reservoir	28-Jul-20	2.7	16.0	0.17	<4	<1	<5	8.07
Everall Sample Station	24-Aug-20	0.1	2.9	0.13	<4	<1	<5	7.93
Malabar Station	24-Aug-20	0.2	3.7	0.29	5	1	<5	8.05
Chestnut & North Bluff Station	24-Aug-20	0.4	1.0	0.08	8	5	<5	8.09
Russell Avenue Sample Station	24-Aug-20	0.2	2.1	0.17	<4	<1	<5	8.11
Roper Reservoir	24-Aug-20	0.1	0.8	0.14	<4	<1	<5	8.12
Roper PRV	24-Aug-20	0.1	1.4	0.11	<4	<1	<5	8.13
Stevens Sample Station	24-Aug-20	0.1	4.2	0.29	18	<1	<5	8.10
Finlay Station	25-Aug-20	0.2	1.0	0.05	<4	1	<5	7.99
Stayte Road Station	25-Aug-20	0.3	5.1	0.52	<4	2	<5	8.09
Balsam & Marine Station	25-Aug-20	0.2	1.9	0.31	<4	<1	<5	8.14
Museum Station	25-Aug-20	0.1	2.8	<0.01	<4	<1	<5	8.13
Oxford & Buena Vista Station	25-Aug-20	0.2	23.0	0.61	<4	5	<5	8.13
Merklin Low Reservoir	25-Aug-20	0.1	47.0	0.07	<4	<1	<5	8.13
Merklin New Reservoir	25-Aug-20	<0.0001	<0.5	0.02	<4	<1	<5	8.14

Oxford Reservoir	25-Aug-20	<0.0001	14.0	0.22	<4	<1	<5	8.13
Everall Sample Station	28-Sep-20	0.4	1.3	0.13	<4	<1	<5	8.00
Mann Park Station	28-Sep-20	0.5	3.5	0.19	<4	2	<5	8.06
Marine Drive Station	28-Sep-20	0.5	4.9	0.24	<4	4	<5	8.10
Russell Avenue Sample Station	28-Sep-20	0.4	1.8	0.12	<4	<1	<5	8.10
Roper Reservoir	28-Sep-20	0.4	0.7	0.09	<4	<1	<5	8.13
Roper PRV	28-Sep-20	0.4	1.7	0.15	<4	<1	<5	8.12
Stevens Sample Station	28-Sep-20	0.4	4.7	0.57	<4	<1	<5	8.12
Oxford & Buena Vista Station	29-Sep-20	0.4	21.0	0.61	<4	1	<5	8.00
Museum Station	29-Sep-20	0.4	3.6	<0.01	<4	<1	<5	8.05
Balsam & Marine Station	29-Sep-20	0.4	1.9	0.32	<4	<1	<5	8.06
Stayte Road Station	29-Sep-20	0.4	4.7	0.46	<4	2	<5	7.90
Finlay Station	29-Sep-20	0.4	1.2	0.06	<4	1	<5	8.04
Merklin Low Reservoir	29-Sep-20	0.4	33.0	0.08	<4	<1	<5	8.09
Merklin New Reservoir	29-Sep-20	0.4	<0.5	0.01	<4	<1	<5	8.08
Oxford Reservoir	29-Sep-20	0.4	14.0	0.13	<4	<1	<5	8.03
Everall Sample Station	26-Oct-20	1.1	2.2	0.13	<4	<1	<5	7.93
Mann Park Station	26-Oct-20	1.1	3.2	0.14	<4	<1	<5	7.97
Marine Drive Station	26-Oct-20	1.1	5.2	0.20	4	2	<5	7.99
Russell Avenue Sample Station	26-Oct-20	1.1	1.5	0.13	<4	<1	<5	8.01
Roper Reservoir	26-Oct-20	1.1	0.7	0.09	<4	<1	<5	8.02
Roper PRV	26-Oct-20	1.1	1.4	0.09	<4	<1	<5	8.02
Roper Avenue Sample Station	26-Oct-20	1.1	4.2	0.52	<4	<1	<5	8.01
Oxford & Buena Vista Station	27-Oct-20	1.1	16.0	0.45	<4	4	<5	7.92
Museum Station	27-Oct-20	1.1	4.7	<0.01	<4	<1	<5	7.96
Balsam & Marine Station	27-Oct-20	1.1	6.8	0.18	<4	<1	<5	7.99
Stayte Road Station	27-Oct-20	1.1	3.8	0.35	7	<1	<5	8.01
Finlay Station	27-Oct-20	1.1	1.1	0.06	<4	<1	<5	8.02
Merklin Low Reservoir	27-Oct-20	1.2	30.0	0.05	<4	<1	<5	8.02
Merklin New Reservoir	27-Oct-20	1.1	<0.5	<0.01	5	<1	<5	8.01
Oxford Reservoir	27-Oct-20	1.0	14.0	0.17	7	<1	<5	8.03
Everall Sample Station	23-Nov-20	1.2	1.6	0.10	<4	<1	<5	7.79
Mann Park Station	23-Nov-20	1.2	3.7	0.10	<4	2	<5	7.95
Marine Drive Station	23-Nov-20	1.2	4.4	0.17	<4	1	<5	7.98
Russell Avenue Sample Station	23-Nov-20	1.3	1.3	0.13	<4	1	<5	7.99
Roper Reservoir	23-Nov-20	1.3	0.6	0.06	<4	<1	<5	7.98
Roper PRV	23-Nov-20	1.3	1.2	0.06	<4	<1	<5	7.99
Roper Avenue Sample Station	23-Nov-20	1.3	3.5	0.38	<4	<1	<5	8.00
Oxford & Buena Vista Station	24-Nov-20	1.3	12.0	0.34	<4	3	<5	7.85
Museum Station	24-Nov-20	1.3	4.7	<0.01	<4	<1	<5	7.97
Balsam & Marine Station	24-Nov-20	1.3	1.7	0.13	<4	1	<5	7.98

Stayte Road Station	24-Nov-20	1.3	3.4	0.27	<4	1	<5	7.99
Finlay Station	24-Nov-20	1.3	1.4	0.06	<4	2	<5	8.00
Merklin Low Reservoir	24-Nov-20	1.3	24.0	0.05	<4	<1	<5	8.00
Merklin New Reservoir	24-Nov-20	1.4	<0.5	<0.01	<4	<1	<5	8.01
Oxford Reservoir	24-Nov-20	1.2	14.0	0.13	<4	<1	<5	8.00

*Out of service for reservoir improvement

In House Water Testing - 2020

Sampling Location	Date Sampled	Time	Conductivity µS/cm	pH	Turbidity NTU	Total CL mg/L	Free Cl mg/L	Temp. Colltd	Temp. Tested
Everall St. Sampling Station		9:45	270	8.26	0.08	0.63	0.03	9.2	16.1
Malabar Sampling Station		10:00	275	8.30	0.14	0.55	0.02	9.2	15.0
Chestnut & N. Bluff Sample STN		10:15	283	8.34	0.16	0.30	0.02	8.4	16.0
Russell Ave. Sample Station		10:30	304	8.40	0.06	0.61	0.02	9.0	15.5
Roper Reservoir		10:45						8.0	
Roper PRV		11:00	306	8.45	0.09	0.63	0.02	9.2	14.8
Roper Ave. Sample Station		11:15	312	8.50	0.08	0.60	0.02	8.4	14.4
Finlay St. Sampling Station		11:30	304	8.43	0.10	0.57	0.01	8.8	14.2
Stayte Sampling Station		11:45	288	8.32	0.11	0.44	0.02	8.9	14.3
Balsam & Marine		12:00	280	8.34	0.10	0.55	0.01	8.9	14.2
Oxford St. & Buena Vista STN		12:15	285	8.31	0.11	0.47	0.02	9.0	14.2
Merklin Low Reservoir		12:30	313	8.50	0.15	0.57	0.02	8.2	14.3
Merklin Reservoir (New)		12:45			0.08	0.59	0.02	7.8	
Oxford Reservoir		13:00	265	8.33	0.08	0.59	0.03	8.1	13.0

THM & HAA RESULTS 2020

Sample	Unit of Measure	Nominal Detection Limit	Sample Location				Sampled Date
			Marine Dr Station	Roper PRV	Stevens Station	Stayte Station	
Chloroform	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	21-Apr-20
Bromodichloromethane	**mg/L**	**0.001**	0.001	0.001	0.001	0.001	21-Apr-20
Dibromochloromethane	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	21-Apr-20
Bromoform	**mg/L**	**0.001**	<0.001	0.001	0.001	0.001	21-Apr-20
Total THMs	**mg/L**	**0.001**	0.001	0.002	0.002	0.002	21-Apr-20
Dibromofluoromethane	**%**	**50-140**	114	116	113	115	21-Apr-20
Toluene-d8	**%**	**50-140**	91	90	90	90	21-Apr-20
Bromofluorobenzene	**%**	**50-140**	91	91	92	92	21-Apr-20
Monochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Monobromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Dichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Bromochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Dibromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Trichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	21-Apr-20
Total HAA6	**ug/L**	**12.0**	<12.0	<12.0	<12.0	<12.0	21-Apr-20
2,3-Dibromopropionic Acid	**%**	**50-150**	86	87	92	91	21-Apr-20
Sample	**Unit of Measure**	**Nominal Detection Limit**	**Sample Location**				**Sampled Date**
			Marine Dr Station	Roper PRV	Stevens Station	Stayte Station	
Chloroform	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	6-Jul-20
Bromodichloromethane	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	6-Jul-20
Dibromochloromethane	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	6-Jul-20
Bromoform	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	6-Jul-20
Total THMs	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	6-Jul-20
Dibromofluoromethane	**%**	**50-140**	99	101	98	97	6-Jul-20
Toluene-d8	**%**	**50-140**	101	102	100	100	6-Jul-20
Bromofluorobenzene	**%**	**50-140**	107	107	107	104	6-Jul-20
Monochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20
Monobromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20

Dichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20
Bromochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20
Dibromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20
Trichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	6-Jul-20
Total HAA6	**ug/L**	**12.0**	<12.0	<12.0	<12.0	<12.0	6-Jul-20
2,3-Dibromopropionic Acid	**%**	**50-150**	100	130	110	110	6-Jul-20

Sample	**Unit of Measure**	**Nominal Detection Limit**	**Sample Location**				**Sampled Date**
			Marine Dr Station	Roper PRV	Stevens Station	Stayte Station	
Chloroform	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	19-Oct-20
Bromodichloromethane	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	19-Oct-20
Dibromochloromethane	**mg/L**	**0.001**	<0.001	<0.001	<0.001	<0.001	19-Oct-20
Bromoform	**mg/L**	**0.001**	<0.001	<0.001	<0.001	0.001	19-Oct-20
Total THMs	**mg/L**	**0.001**	<0.001	<0.001	<0.001	0.001	19-Oct-20
Dibromofluoromethane	**%**	**50-140**	112	93	109	110	19-Oct-20
Toluene-d8	**%**	**50-140**	96	99	99	104	19-Oct-20
Bromofluorobenzene	**%**	**50-140**	101	106	104	110	19-Oct-20
Monochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Monobromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Dichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Bromochloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Dibromoacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Trichloroacetic Acid	**ug/L**	**2.0**	<2.0	<2.0	<2.0	<2.0	19-Oct-20
Total HAA6	**ug/L**	**12.0**	<12.0	<12.0	<12.0	<12.0	19-Oct-20
2,3-Dibromopropionic Acid	**%**	**50-150**	96	110	110	110	19-Oct-20

Non Routine Water Quality Results for Source and Distribution Water 2020

Sampling Point Name	Date Sampled	TC MPN / 100 ml	E-coli MPN / 100 ml	Comments
15400 Block Pacific Ave	Jan 21 2020	<1.0	<1.0	Below MAC
1200 Block Kent St	Jan 22 2020	<1.0	<1.0	Below MAC
1500 Block Brearley St	Mar 17 2020	<1.0	<1.0	Below MAC
13901 Malabar Ave	Apr 13 2020	<1.0	<1.0	Below MAC
1500 Block Kerfoot	Apr 30 2020	<1.0	<1.0	Below MAC
Museum Sampling Station	June 4 2020	<1.0	<1.0	Below MAC
Finlay St Sample Station	June 11 2020	<1.0	<1.0	Below MAC
Roper Ave Sampling Station *Re-test for June 15 Coliforms	June 18 2020	<1.0	<1.0	Below MAC
1300 Block Martin St - Main Leak	June 19 2020	<1.0	<1.0	Below MAC
Roper Ave Sampling Station *Re-test for June 29 Coliforms	July 2 2020	<1.0	<1.0	Below MAC
Malabar Ave Sampling Station *Re-test for July 27 Coliforms	July 30 2020	<1.0	<1.0	Below MAC
Russell Ave By-Pass	October 30 2020	<1.0	<1.0	Below MAC
Everall Sample Station	October 30 2020	<1.0	<1.0	Below MAC
Oxford and Buena Vista	November 10 2020	<1.0	<1.0	Below MAC
1071 Parker St	November 24 2020	<1.0	<1.0	Below MAC
Russell Ave Sample Station	December 14 2020	<1.0	<1.0	Below MAC
Mann Park Sampling Station	December 21 2020	<1.0	<1.0	Below MAC
	Amount of Times 1.0 or Higher:	0	0	